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ABSTRACT

The problem of lack of information regarding the relationship among second language students' language ability, metacognition, and reading materials is examined. The study investigates how reading strategies transfer from the native language to the second language within an interactive and compensatory processing model framework. It examines the similarities and differences in processing within the foreign language (e.g., Spanish) on the basis of text-type (authentic versus simplified). Findings suggest that students process passages in the foreign language differently compared to their processing of the native language. Strategies of successful readers in the foreign language, however, tend to resemble strategies used in the native language. Strategies used to process edited texts are significantly different from those used for processing authentic texts. Successful reading comprehension by text appears to be more a function of either strategies employed or background familiarity, and not language proficiency. Contains 82 references. (Author/LB)

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A Research Study on the Question of Native and Non-Native Reading Strategies and Authentic Versus Edited Texts

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ABSTRACT

The present study addresses the problem Swaffar, Arens and Byrnes identify as a lack of information regarding the relationship among second language students' language abilility, metacognition and reading materials. This study investigates how reading strategies transfer from the native language to the second language within an interactive and compensatory processing model framework. It further attempts to examine the similarities and differences in processing within the foreign language (in this case Spanish) on the basis of text-type (authentic versus simplified). More specifically, the research reported here examines: 1) the relationship between strategies used by native English speakers to process English and Spanish texts; 2) the strategies used for two text types, a graded passage in Spanish (written for the level of the learner) and an authentic passage in Spanishy (non-graded and not edited); 3) the relationship between strategy types and Spanish proficiency level (years of language study); 4) the relationship among topic familiarity, strategies used by varying levels of proficiency in Spanish, and two text types (edited and authentic); 5) the relationship between students' self-perceptions of strategy use and actual strategy use.

Findings in this research suggest students process passages in the foreign language differently compared to the native language. Strategies of successful readers in the foreign language, however, tended to resemble strategies used in the native language. Strategies used to process edited texts were signitificantly different from those used for processing authentic texts. And, successuful reading comprehension by text was more a function of either strategies employed or background familiarity and not language proficiency.

A Research Study on the Question of Native and Non-Native Reading Strategies and Authentic Versus Edited Texts

INTRODUCTION

The President's commission on Foreign Language and International Studies (1979) presented a mandate to second language teachers. Our task was no longer simply to teach language as such, but rather to enable American students to learn cultural, scientific, technological, and business information by means of a foreign language. Such a mandate arose out of research in foreign language and second language (L2 for both) learning that suggests our profession has failed to capitalize on the cognitive maturity of adult students. This research strongly suggests that adult readers of a second language can use their pre-existing metacognitive strategies -- knowledge about how their first language functions and sophisticated background experience with the real world -- to offset deficiencies in second language mastery. Unfortunately the specifications about how L2 students should use this knowledge are incompletely understood and have been subject to little investigation. If we are to build successful interdisciplinary programs that use foreign languages as their instructional medium, successful reading comprehension of authentic texts must be a prime objective. Before we

can embark on a program of reading authentic materials at earlier stages than heretofore thought feasible, the profession needs to engage in empirical investigation of the relationship between metacognitive strategies in first and second language reading.

Within the past ten years scholars have engaged in fewer than one hundred fifty studies of L2 reading. Of these only a handful look closely at the interrelationship of readers' strategies and comprehension. The most notable assessments fall into three categories: 1) the studies that test various measures of reading performance to assess the impact of particular language-based strategies such as lexical recall or command of syntax (e.g., Bensoussan, 1986; Berman, 1984; Cooper, 1984); 2) the studies that assess reader-based strategies such as schemata (e.g., Bernhardt, 1987; Carrell, 1983, 1984b; Carrell & Eisterhold, 1983; Hosenfeld, 1976; Johnson, 1982; Kern, 1988; Lee, 1986a; Melendez and Pritchard, 1985; Steffensen and Joag-Dev, 1984; Wolff, 1987); 3) the studies that compare performance between L2 and native language (L1) reading or between readers of different language levels (e.g., Allen, Bernhardt, Berry, 1988; Bialystok, 1981; Clarke, 1979; Connor, 1984; Lee, 1986b). While Barnett (1988b) has explored the impact of strategy training on language and background factors, no work to date has explored all three variables: language level and reader experiential background in conjunction with the cognitive impact of both native and non-native reading strategies.

The present study examines how reading strategies transfer from the L1 to the L2 within an interactive and compensatory processing model framework. It further attempts to investigate the similarities and differences in processing within the foreign language (in this case Spanish) on the basis of text-type (authentic versus simplified). It addresses the problem Swaffar, Arens and Byrnes (1991) identify as a lack of "information about the relationship between the metacognition of L2 students, linguistic ability, and variety in their reading materials. . . ." (p. 58).

More specifically, the research reported here examines: 1) the relationship between strategies used by native English speakers to process English and Spanish texts; 2) the strategies used for two text types, a graded passage in Spanish (written for the level of the learner) and an authentic passage in Spanish (non-graded and not edited); 3) the relationship between strategy types and Spanish proficiency level (years of language study); 4) the relationship among strategies used by varying levels of proficiency in Spanish, topic familiarity, and two text types (edited and authentic); 5) the relationship between students' self-perceptions of strategy use and actual strategy use.

REVIEW OF LITERATURE

Theoretical Models of Reading

In the last decade, L2 reading research has been characterized by a process-oriented approach to comprehension based on the work of

cognitive psychologists. Several types of process-oriented models reflecting the complex nature of L2 reading have evolved from the literature, i.e., bottom-up and top-down processing and the interactive processing model. Of these, only the interactive model has been well received in the profession. Reading comprehension under this model is achieved through an interaction among multiple knowledge sources, such as the text, the reader's foreign language proficiency and reading strategies, and the background experiences the reader brings to the text. Allied to this interactive model is the compensatory model (Stanovich, 1980), whereby a deficit in any knowledge source leads to use of other knowledge sources. Currently, we have a body of literature that supports various aspects of these two models (Anderson, 1984; Bernhardt, 1984, 1987, 1986a, 1986b; Clarke, 1980; Carrell, 1983, 1984b, 1988; Just and Carpenter, 1980; Kintsch and van Dijk, 1978; LaBerge and Samuels, 1974; Lee, 1986a; Rumelhart, 1977a, 1977b, Wolff, 1987). Wolff's (1987) research on the differences in text processes between first language and L2 led him to several hypotheses regarding L2 comprehension within the framework of an interactive processing model. Wolff hypothesizes that

> L2 learners who have begun L2 acquisition will almost exclusively resort to concept-driven processing when reading texts or trying to decode utterances. . . L2 learners who have acquired a certain amount of linguistic knowledge in their L2 can use bottom-up processing to a higher degree, although a predominance in favour of top-down processes will still be noticeable (p. 313).

Transfer of Strategies

Many researchers (Alderson, 1984; Allen, et al., 1988; Al-Rufai, 1970; Barnett, 1988a; Bialystock, 1981; Block, 1986; Clarke, 1979; Connor, 1984; Hauptman, 1979; Hosenfeld, 1984; Lapskin and Swain, 1977; Lee and Ballman, 1987; McLeod and McLaughlin, 1986, Sarig, 1987; Young, 1991) recognize the need for further inquiry into the question of strategy transference from one language to another. Of the few studies that have actually been done in this area, most are in English as a second language. But while some researchers have found similarities in reading processes between the L1 and L2 (Block, 1986; Connor, 1984; Kern, 1988; and Sarig, 1987), other researchers not only suggest that reading processes between the L1 and L2 are different (Bernhardt, 1987; Cziko, 1978, 1980; Kozminsky and Graetz, 1986; McLeod and McLaughlin, 1986) but also contend that the learner's language proficiency is the determining factor (Barnett, 1989, p. 44).

Within an interactive model of L2 reading, the significant question is whether transfer of reading strategies, background knowledge or increased proficiency in the L2 play the pivotal role (Anderson, 1984). Researchers in the past have tended to fall into two camps. One group contends that reading comprehension is primarily a function of language proficiency (Clarke, 1979; Cziko, 1980; Macnamara, 1970). As language proficiency increases, so does reading ability. The other group contends that students' high cognitive level strategies in L1 can transfer to L2 and can function alongside lower level processing strategies (Benedetto,

1984; Block, 1986; Coady, 1979; Cummins, 1980; Hudson, 1982). In support of an interactive-compensatory model of L2 reading (See Stanovich, 1980), Wolff (1987) contends that reading strategy use is more important in reading comprehension in L2 than in the native language (p. 315). The less proficient a learner is in the language and the more difficult a text, the more important strategies become for reading comprehension. The unknown quantity in this debate is the students' capacity for quantitative and qualitative strategy use at varying levels of language proficiency.

Strategy types

Second language research has looked both at how strategies are used and/or how they relate to successful reading comprehension (Anderson, 1989; Bernardt, 1987; Garner, 1980; Golingkoff, 1976; Hare, 1981; Kavale and Schreiner, 1979; Kletzien, 1991; Munby, 1979; Olshavsky, 1976-77; Pritchard, 1990). Hosenfeld (1976), however, is the only study in reading strategies used by native English speakers learning Spanish. Using oral interviews conducted during the actual reading process, Hosenfeld wanted to see if there was a correlation between strategy style and success as measured on MLA test scores. After interviewing the twenty highest and lowest scorers, Hosenfeld reported the following reading processes as characteristic of "successful" L2 readers of Spanish whose native language is English. The "successful" readers typically use strategies such as keeping the meaning (content) of the passage in mind as they read, skipping words they view as

unimportant to total phrase meaning, looking up words in the back of the book only as a last resort (p. 121). Characteristically such readers thought about the text in their own English or Spanish words (rather than direct translation) and had a positive image of themselves as readers. Unsuccessful readers engaged in opposite behaviors such as word for word reading and extensive literal translation. More recently, however, researchers have suggested that the study of strategy use is more complex than just comparing good and poor reader's reading strategies (Anderson, 1989; Block, 1986; Cohen, 1986; and Sarig, 1987).

Authentic versus Edited Texts

In spite of current interest in using authentic texts in L2 reading, very little data on the effect of authentic texts on foreign language readers has been collected (Vogely, 1989). Swaffar (1985) argues that carefully edited passages are linguistically and culturally sanitized and lack essential characteristics of authentic messages such as redundancy, repetition and discourse markers, assertions made also by Grellet (1981), Honeyfield (1977), and Widdowson (1975). Swaffar contends, furthermore, that by simplifying texts we deny students the often "idiosyncratic, colorful authorial cues which characterize a genre and sort or label its textual message system for the reader" (p. 17). Vigil's (1987) study provides support for these contentions. In her study, students who read Spanish authentic texts versus simplified ones did not differ in reading comprehension but did differ in their oral interviews. Students who read authentic material exhibited the ability to make intelligent

guesses, communicate ideas coherently, and rely on contextual cues and references. Similarly, Allen, Bernardt, Berry and Demel (1988) looked at how high school foreign language students coped with authentic texts and found that these students actually "performed competently in all the authentic texts they were asked to read" (p. 168). Interestingly though, the teachers in the study had thought the texts too difficult and speculated that the students would not be able to "handle" the readings (p. 168). The researchers argue that "foreign language educators have tended to underestimate and spoonfeed learners, maintaining that they had to achieve a certain level of grammatical ability before they could attempt authentic texts" (p. 170). A study by Lee and Musumeci (1988) further supports the notion that students' potential for comprehension of authentic texts has been underestimated.

Methodological Concerns

In this research, the primary use of the think aloud procedure, a modified oral interview that allows for comment on the reading process after exposure to a text, is to identify differences among groups of language learners in strategy use, but this procedure is not without criticism. Some researchers have expressed concerns about the self-report data and think alouds in particular (Cavanaugh and Perlmutter, 1982; Garner and Anderson, 1981-82; Hare, 1981; Nisbett and Wilson, 1977) and have made suggestions for collecting self-report data. Ericsson and Simon (1980, 1984) offer specific suggestions such as:

1) not having verbalization concurrent with task performance,

2) minimizing the time interval between processing and retrospective reporting,
3) probing in nonspecific, noncueing fashion,
4) making it clear to subjects that the task is the primary focus -- not the verbal reporting of the processes, and
5) collecting other data and correlating it with self-report data" (Kletzen, 1990, p. 7).

By following these suggestions, researchers can indeed provide insights into learners' reading strategies (Ericsson and Simon, 1980, 1984; Garner, 1982, 1987, Olson, Duffy and Mack, 1984). Afflerback and Johnston (1984) further elaborate that think alouds "provide veridical descriptions of cognitive processes which otherwise could only be investigated indirectly . . . they allow access to the reasoning processes underlying higher level cognitive activity . . . they are sometimes the only available avenue for historical or genetic analysis of mental processes" (p. 308 from Kletzien, 1990, p. 7).

RESEARCH QUESTIONS

The present study is an attempt to provide empirical data on a number of issues in L2 reading research. More precisely, it attempts to investigate the following questions.

1. Do learners of Spanish as a foreign language use the same strategies to read in the L2 as they do to read in L1?
2. Do learners of Spanish use the same strategies on a variety of

text types (edited versus authentic texts)?

3. Is Spanish language proficiency (years of language study) related tothe types of strategies used to process a text?
4. What is the relationship among strategies used, level of proficiency in Spanish, topic familiarity, and text types?
5. Is there a correlation between students' self-perceptions of strategy use and actual strategy use in the L2 and L1?

METHOD

Subjects

A total of one hundred and seventy-three university students at a major university in the United States participated in the first phase of this project. The subjects were students of Spanish: fifty-three in first year; fifty in second year, thirty-three in third year, and thirty-seven in fourth. Their ages ranged from 17 to 33 with fifty-nine per cent in the 19-21 age range.

In the second phase of this study, a total of forty-nine students participated in a think aloud procedure, a modified oral interview that allows for comment on the reading process after exposure to a text, and a reading recall task, oral recalls of the content of each text. Think alouds and oral recalls were performed on three passages, a Spanish authentic passage, a Spanish edited passage and an English passage. Subjects for this phase of the study were identified on the basis of their scores on the Spanish Advanced Placement Exam and/or reading scores so that

there would be a better distribution of high, mid and low scorers represented. An attempt was made to obtain at least ten subjects per level, but the third year pool was smaller than the others; subjects of this phase of the study consisted of thirteen first-year, fourteen second-year, nine third-year, and thirteen fourth-year students. Students in the first year were in their second semester, and second year students were in their fourth semester of Spanish. Students in the junior level course were in their sixth semester of Spanish. One of the junior-level courses was a conversation class and the other a reading class. Students in the senior level course had completed at least seven semesters of Spanish or the equivalent. One of the senior-level courses was in Spanish civilization and the other in applied linguistics.

Instruments

All 173 subjects in the first phase of this study were given the following tests, in the following order: a) The Nelson-Denny Reading Test (a test of English reading comprehension); b) an adapted version of Marva Barnett's "Self-Perception of Strategies," (a questionnaire that assesses student's perceived use of reading strategies in English); c) an adapted version of Barnett's (1988a) "Self-Perception of Strategies" (to assess student's perceived use of reading strategies in Spanish);[1] d) The Spanish Advanced Placement Exam (40 minutes of reading comprehension, 30 minutes of listening comprehension, and 5 minutes of vocabulary). Third and fourth-year students were given a reading comprehension test in Spanish in lieu of the Spanish Advanced

Placement Exam, since it is used as a placement exam and not used to assess intermediate or advanced language skills. The reading test was developed by this researcher.

Student proficiency scores were averaged on the basis of student's grade in the course and, for first- and second-year students, their cumulative score on the Advanced Placement. For third- and fourth-year students, their proficiency scores were averaged on the basis of their grade and their score on a reading test .[2]

In the second phase of this research, three texts were selected for the think aloud and the recall tasks. The Spanish edited texts consisted of passages from the textbook used at that level. Passages were selected from chapters students had not yet read, and topics varied according to the course, but all three had cultural themes. A Spanish authentic passage, as used in this action research, is defined as one written for native Spanish-speakers by native speakers. For this reason several considerations were made for the selection of this passage. A passage from a popular Spanish magazine was selected on the basis of its potential interest, visual cues, and conceptual organization. The Spanish authentic passage focussed on myths about chocolate and was selected from a popular Spanish magazine, similar to **Good Housekeeping**. Care was taken in the selection of the English passage to select a reading that was conceptually challenging, one where students were not apt to have much topic familiarity so as to encourage students to use strategies in their native language. The

English text was taken from **Scientific American** and was about the invention of the scanning tunneling microscope.

Students' background knowledge of each passage topic was assessed by their rating of the passage topic as very familiar, somewhat familiar, or not familiar.

Think aloud protocols. The strategy classification developed in this study for analysis of the think aloud protocols was derived from a variety of sources.[3] Thirteen "local strategies," and twelve "global strategies," similar to Block (1986), comprised the essence of the strategy classification scheme, with two metacognitive strategies "comment on behavior or process" and "non-use of awareness of strategy use" resulting in a total of 27 strategies in this classification scheme (See Appendix A for strategies classification). Local strategies focussed on word, phrase and sentence level concepts, such as skipping unknown words, breaking lexical items into parts, translating a word or phrase, and paraphrasing. Global strategies focussed on conceptual and discourse level concepts, such as anticipating content, integrating information, and recognizing text structure. An attempt was made to parallel local strategies with bottom-up processing and global strategies with top-down processing.[4] Inter-rater reliability coefficients of .90 (for the edited passage), .85 (for the authentic passage), and .81 (for the English passage), $p. < .01$ were achieved for number of strategies used and moderate to strong correlations for strategy classification schemes .[5]

Reading Recall Protocols. I used Bernhardt's (1988) procedure for the development and scoring of the recall protocols because... The first step in using recall protocols as an instrument to measure reading comprehension is to develop a recall protocol scoring template. A total of six fluent readers of Spanish (three native and three non-native speakers) read the texts to themselves and identified pausal units. A pausal unit is a natural break or breath group under a normal oral reading of a text. On the occasions where there were differences, the more narrow units were selected as defined in Bernhardt (1988). The second step is to assign weights to the pausal units or propositions. Three fluent readers of Spanish ranked pausal units from 1 (least significant) to 3 (most significant) in terms of the unit's importance to the message of the passage. In the cases where there was disagreement, a consensus determined the weight of the unit in question. In scoring the recalls, inter-rater reliability coefficients of .89 (for level 3 propositions), .81 (for level 2 propositions) and .58 (for level 1 propositions), $p. < .01$ were achieved. An explanation for lower reliability coefficients for level 1 propositions can be offered in that there were very few level 1 propositions identified thereby making any differences appear greater.

Procedure

Arrangements were made with instructors of two randomly selected second semester, fourth semester, junior level and senior level Spanish classes so that time would be allowed for a two-hour period of data collection. Once scores were calculated from the array of language

and comprehension tests and clusters of high, mid, and low scorers identified, subjects were contacted and arrangements made for the second phase of data collection. The first part of the data-gathering phase consisted of approximately three weeks and was carried out by this researcher. This researcher and two graduate students who were trained to administer both the think aloud and the recall, collected data for the second phase of this study. The two graduate students interviewed approximately twenty of the forty-nine subjects. Students were given an initial warm-up passage to get better acquainted with the experimental situation and to check that the tape was recording. During the warm-up, the experimenters could disrupt the experiment by asking or answering questions, but during the actual experiment care was taken to not interfere with subjects' thoughts. The order of the Spanish readings varied so as to control for possible ordering effects: one-half of the subjects read the edited Spanish text first, then the authentic text, the other half read the authentic first and the edited second. The English passage was consistently the last text to be read. Immediately after each reading students were asked to tell everything they thought about during the reading that helped them understand what they were reading. For each passage, student reading time was documented and after all passage tasks had been completed, they were asked to rate their familiarity with the passage topic before the reading and to rate their understanding of the reading. Lastly, students were asked to "recall

everything you remember from this text." Students were asked here to focus on what the text was about.

ANALYSIS AND RESULTS

1. Do learners of Spanish as a foreign language use the same strategies to read in the L2 as they do to read in L1? Results of this study indicated that strategies in the native language were significantly different from strategies in the foreign language. Results of a t-test on the differences in strategy use for the Spanish texts and the English text are reported in Table 1. University-level Spanish students used significantly more **local strategies** (word-related strategies, such as breaking words into parts, using cognates, skipping words) when reading Spanish passages and more **global strategies** (concept-related strategies, such as skimming, reading headings, looking at pictures, recognizing text structure) when reading a passage in English (See Appendix A for strategies classification). In all statistical procedures executed on these data, this pattern of strategy use held constant.

2. *Do learners of Spanish use the same strategies on a variety of text types (edited versus authentic)?* Results of a t-test indicate that there is a significant difference between strategies used to process the Spanish edited passage versus the Spanish authentic passage for all subjects (See Table 2). Students used primarily local strategies in their reading of both the edited and authentic texts. Interestingly, however, they used significantly fewer local strategies to read the authentic text as

compared to the edited one (Table 3). When these data were analyzed according to proficiency level using an ANOVA, however, there were no significant differences between the kinds of strategies used to process the Spanish edited passage as compared to the Spanish authentic passage (Table 4).

3. Does Spanish language proficiency affect the types of strategies used to process a text? Results of a t-test suggest that as students gain language proficiency or competence, they begin to use fewer local strategies, with the exception of the second year students who actually used statistically significantly more local strategies than first-year students (Table 5). Interestingly, however, there were no statistically significant differences between the amount of time spent reading each Spanish text and the student's proficiency level (years of study).

4. What is the relationship among strategies used, level of proficiency in Spanish, topic familiarity, and text types? Regression analysis was performed on these data to answer this question. Reading comprehension was used as the dependent variable as reflected in the recall scores.[6] Students' language proficiency, topic familiarity, and processing strategies (global versus local) were used as the independent variables. These results are reported in Table 6.

Successful reading comprehension of the edited text was found to be significantly related to global reading strategies ($t = 3.72$, $p < .0006$). In other words, students who used more local reading strategies to process the edited passage attained lower comprehension scores than

those who used global reading strategies. On the other hand, neither global nor local strategy use was a predictor of successful comprehension for the Spanish authentic passage; topic familiarity best predicted high recall scores for the Spanish authentic passage ($t = -3.00$, $p < .0045$). For the English text, again topic familiarity best predicted high comprehension scores ($t = -2.50$, $p < .01$).

On the one hand, there was no relationship between how well students thought they understood the Spanish authentic passage and their familiarity with the passage. In other words, in rating their understanding of the Spanish authentic passage, students indicated that they did not have to be familiar with the topic to understand the passage. On the other hand, there was a significant relationship between topic familiarity and how well they thought they understood the Spanish edited ($r = .52$, $p < .0001$) and English passage ($r = .29$, $p < .03$). Although these correlations are moderate, students reported having to be familiar with the passage topic to understand the edited passage and the English passage. Students also repeatedly commented that the Spanish edited passage was more difficult to read.[7]

5. Is there a correlation between students' self-perceptions of strategy use and actual strategy use in the L2 and L1? In this study, there was a significant relationship between the strategies students perceived themselves using across levels in Spanish and those they perceived themselves using in English ($r = .26$, $p < .01$). When examined by proficiency level, however, only students of first-year and fourth-year

Spanish reported similar strategy use in both languages (See Table 7). There was no significant relationship between perceived use of strategies in Spanish and English for students of second and third-year Spanish.

DISCUSSION

L1 versus L2 strategy use

This study suggests students process passages differently in their native language than in their foreign language, but there is some evidence to also suggest that as students' proficiency in the foreign language increases, they move in the direction of processing texts in the same way they do in the native language. Although the differences between strategy use from one level of Spanish to the next were not significant, with the exception of the second year, I suspect that if the number of subjects at each level had been larger, we might have seen a stronger trend toward differences. One explanation for the significantly higher use of local strategies in the second year versus other levels may rest with the interviewer's approach to the "think aloud" procedure. This interviewer often probed students, i.e., by asking them to "explain what they did when they did not understand a word," and conducted lengthier interviews, making the results for second year less valid.

Text types

An explanation for the lack of a correlation between students' rating of their understanding of the Spanish authentic passage and their topic familiarity for that passage may rest with the high number of cues

offered in the Spanish authentic passage. The Spanish authentic passage offered clear headings and subheadings, and the information was well-organized, often inherent qualities of authentic texts. In addition, the intent of the passage was clear -- to dispel myths about chocolate. Conversely, the edited passages had fewer organizational cues, pictures and subheadings, also inherent qualities of edited passages.

Even though there was no relationship between students' rating of how well they understood the Spanish authentic passage and their topic familiarity, a regression analysis did indicate that topic familiarity was the best predictor of high comprehension scores for the authentic passage. Students who knew something about myths about chocolate understood more than students who did not. Since the recall scores for this passage were higher than for the other passages, and since students did report that they did not have to be familiar with the topic to understand it, I speculate that this passage could be easily comprehended by most students because of its textual cues, and the students who had familiarity with the topic had an even greater edge. In contrast, there was a relationship between how well students thought they understood the Spanish edited and English passages and their familiarity with the passage topics. The key factor with these texts was strategy use, suggesting that if students do not have familiarity with the passage topic, strategies become the next best tool.

Interactive processing

The findings in this study suggest that students process texts using local strategies when the text is difficult to read, as were the edited texts in this study. Textual difficulty is determined by the reader's familiarity with the passage topic, their strategy behavior, and the language (i.e., structures, syntax, vocabulary, and the rhetorical and structural cues given) of the text. These findings also suggest that students use global strategies to process a relatively simple text, such as the authentic one in this study. The difficulty level of the text is again determined not only by the language in the text but also by the familiarity students have with the topic, and is reflected in the strategies they employ to read the text.

With regard to successful comprehension of these texts, there was a discrepancy between how students actually process texts and how they may need to process texts for successful comprehension to take place. This study indicates that while topic familiarity accounted for high comprehension scores in both Spanish and English authentic passages, strategy use was the key factor in successful comprehension of the edited passage; while most students used local strategies in processing the edited passages, the students who used more global strategies had better comprehension. Previous research has repeatedly suggested that background knowledge plays a significant role in reading comprehension, but when readers lack the appropriate background knowledge they evidently resort to local strategies (bottom-up processing) when in fact global strategies (top-down processing) may need to be included for better comprehension.

The implication here is that language proficiency is not always the key factor within an interactive processing model of reading, as was once thought (Alderson, 1984). In essence, for both L1 and L2, concept-driven processing, as reflected in using background knowledge or global strategies, best predicted successful reading comprehension. The findings in this research further support the claim that "presenting texts that deal with subjects familiar to and of interest to the L2 reader seems all the more important" (Swaffar et al., 1991, p. 49). Furthermore, this study suggests that successful readers try to compensate for deficiencies in knowledge bases, such as background knowledge, proficiency or strategies, and may do so by engaging in concept-driven processing first and resorting to bottom-up processing as a last resort.

Perceived strategy use

The findings regarding students' self-perception of reading strategies were not consistent across levels. Note, however, that the correlation is not strong for either first or fourth year groups. A possible explanation for these results is that beginning language students perceive the strategies they use in English to be similar to the ones they are using in the foreign language. At this point, students have limited reading experience in the foreign language; however, as they continue their language learning, their perceptions change. After their first year, they do not perceive themselves using the same strategies in Spanish that they do in English. Perhaps the greater their reading experience, the clearer it becomes that they do not necessarily process the same way.

By the fourth year, however, they again perceive themselves using similar strategies in Spanish as they do in English. And, in fact, the findings in this study indicate that as students become more proficient, they use fewer local strategies. The fewer local strategies they use, the more they move in the direction of processing as they do in English, where they rely predominantly on global processing strategies, which in turn, improves their reading comprehension.

CONCLUSIONS

There are several significant theoretical and pedagogical implications of this research. First, the question of native and non-native reading strategies transfer must be viewed within a theoretical framework. The use of strategies cannot be viewed as an isolated and independent reading variable. Second, this study provides empirical data to support an interactive and compensatory model of foreign language reading. The interactive processing model has been well-received in the profession from a theoretical perspective, but little empirical data has been gathered to verify it. Reading comprehension takes place under this model through an interaction among multiple factors, such as textual difficulty, the reader's foreign language proficiency, and the background knowledge the reader brings to the text. This study offers some insight into the complexity of the interaction among these variables. While quantitative findings in this study provide evidence for this model of reading, future researchers may want to

provide qualitative analysis of data that might lead to further insights, such as those found by Sarig (1987). Third, little empirically-based research has been conducted regarding processing and comprehension differences between edited and authentic texts. This study suggests differences in terms of processing and comprehension between these two texts. Future research may want to examine the differences in processing strategies used for Spanish edited texts versus authentic texts with a larger sample population, and with perhaps 3 to 5 text types. Other factors to be considered in a comparison of edited versus authentic reading material include interest level for the student, perceived textual difficulty level, and reading cues. Fourth, early cognitive studies of the reading process in both the first and second language focussed on identifying good and poor reading strategies. From that body of research, predominant use of local strategies in the first or foreign language have consistently related to poor reading comprehension. The findings in this study support this previous research; students who employed global or concept-driven processing strategies had higher comprehension scores than those who used predominantly local or bottom-up processing strategies. **The implication for teaching is that foreign language reading instruction should train students to use conceptually-driven strategies in their processing of foreign language texts.** Training students to read strategically should be an objective from the start.

NOTES

[1] Test re-test reliability coefficients for the "Self-Perception of Strategy Use" questionnaire were .59, $p. < .05$ for the English version and .87, $p. < .001$ for the Spanish version.

[2] A t-test on the reading test scores for students in the third year and above indicated that the reading test discriminated between these intermediate levels ($t=-4.46$, $p. < .001$).

[3] See Anderson, 1989; Block, 1988; Carrell, 1989; Kletzien, 1990; and Pritchard, 1990.

[4] Swaffar, Arens, and Byrnes (1991) identify top-down and bottom up text-based and reader-based components as follows:

Top-down factors: reader

1. reader background (semantic knowledge);
2. reader perspective (reading strategies).

Top-down factors: text

3. text schema (topic);
4. text structure (organizational pattern of the information);
5. episodic sequence (scripts or story grammars).

Bottom-up factors: text and reader

6. illustrative detail (micropropositions);
7. the surface language features of the text in letters, words, and individual sentences;
8. reader language proficiency

[5] There were a few strategies that were not significantly correlated, but these were strategies that were infrequently used by students, such as paraphrasing, identifying the main idea, recognizing text structure. Since fewer of these strategies were reported, it made differences in scorer coding appear greater.

[6] Bernhardt (1988) reports an average recall score of 20% (30% for upper levels) for subjects in her study. She points out that even a native speaker would not recall more than 80%. She cites 20% to 30% recall as quite remarkable for an edited text. In this study, the average recall score for the authentic text was 24%. The average recall score for the English text was 17% and for the Spanish edited, 15%. An explanation for the higher recall scores in Bernhardt's study rests with the length of her passages, which were much shorter than the ones used in the study reported here.

[7] In D. Young, "L2 reading in Spanish: Factors in reading authentic versus edited passages", forthcoming.

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APPENDIX A

Table 1
Local and Global Strategy Differences for Each Text
Across Levels of Spanish

Variable	N	MEAN	SD	T	PR>(T)
ED DIF	49	5.08	7.83	4.54	0.0001
SA DIF	49	2.67	8.35	2.24	0.0297
EA DIF	49	-2.18	5.09	-3.00	0.0043

ED = Spanish Edited Passage
SA = Spanish Authentic Passage
EA = English Authentic Passage

To answer the question, is there a difference between local and global strategy use, I subtracted the number of local strategies from the number of global strategies reported for each text (ED, SA, EA) and with the resulting score I ran a t-test against 0.

Table 2
Strategy Differences Between Spanish Edited
and Spanish Authentic Across Levels

Variable	N	MEAN	SD	T	PR>(T)
ED - SA	49	2.40	6.9	2.43	0.018

ED - SA is the difference in strategies for the Spanish edited passage minus the difference in strategies for the Spanish authentic passage.

Table 3

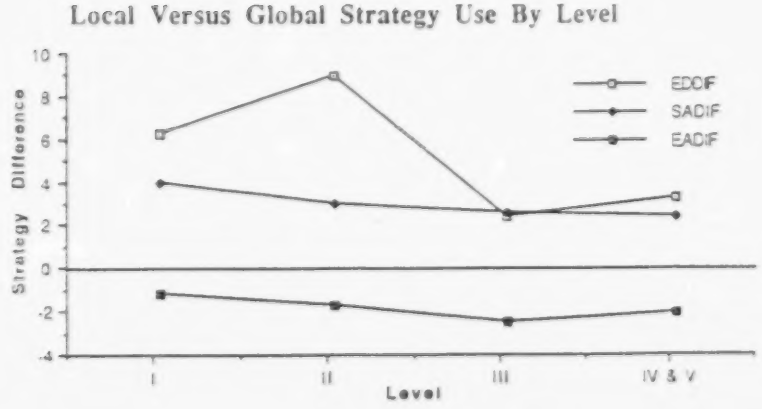

Table 4
Strategy Differences Between Spanish Texts Types by Level
General Linear Models Procedure

Dependent variable: ED - SA			
Source	DF	Sum of Squares	Mean Squares
Model	3	262.962	87.654
Error	45	2038.873	45.308
Corrected Total	48	2301.8367	
Model F =	1.93		Pr>F = 0.1375

Table 5
Strategy Differences Between Spanish Text Types by Level

Level	Variable	N	MEAN	SD	T	PR>(T)
I	ED-SA	14	2.214	5.577	1.49	0.161
II	ED-SA	13	6.00	9.478	2.28	0.041
III	ED-SA	10	-0.200	4.894	-0.13	0.900
IV	ED-SA	12	0.916	5.567	0.57	0.579

ED - SA is the difference in strategies for the Spanish edited passage minus the difference in strategies for the Spanish authentic.

Table 6
Predictors of Recall Scores

SPANISH EDITED PASSAGE

Dependent variable: SPED

Source	DF	Sum of Squares	Mean Square	F	Value Pr > F
Model	4	458.57748	114.64437	3.89	0.0089
Error	42	1237.42252	29.46244		
Corrected Total	46	1696.00000			

R-Square

0.270388

Parameter	Estimate	T for HO: Parameter=0	Pr > (T)
PROFIC	-0.11188077	-1.82	0.0758
EDLS	-0.16841951	-1.55	0.1297
*EDGS	1.01149423	3.72	0.0006
FAM1	1.61978053	1.49	0.1425

SPED is Spanish **Edited** passage
PROFIC is proficiency
EDLS is edited passage, local strategies
EDGS is edited passage, global strategies
FAM1 is familiarity rating for the edited passage

SPANISH AUTHENTIC PASSAGE

Dependent Variable: SPAUT

Source	DF	Sum of Squares	Mean Square	F	Value Pr > F
Model	4	950.41766	237.60441	2.58	0.0517
Error	41	3782.90843	92.26606		
Corrected Total	45	4733.32609			

R-Square

0.200793

Parameter	Estimate	T for HO: Parameter=0	Pr > (T)
PROFIC	0.10815376	0.98	0.3314
SALS	-0.9643872	-0.43	0.6727
SAGS	0.36124209	0.81	0.4247
*FAM2	-6.09341905	-3.00	0.0045

SPAUT is **Spanish Authentic** passage
PROFIC is proficiency
SALS is Spanish authentic passage, local strategies
SAGS is Spanish authentic passage, global strategies
FAM2 is familiarity rating for the authentic passage

Table 6 (cont.)
Predictors of Recall Scores

ENGLISH PASSAGE

Dependent Variable: ENGP

Source	DF	Sum of Squares	Mean Square	F	Value Pr > F
Model	3	415.27399	138.42466	3.34	0.0280
Error	42	1738.46514	41.39203		
Corrected Total	45	2153.73913			

R-Square

0.192815

Parameter	Estimate	T for HO: Parameter=0	Pr > (T)
EALS	0.21355488	0.56	0.5756
EAGS	0.49790251	1.63	0.1100
*FAM3	-4.26668784	-2.50	0.0164

ENGP is English passage
EALS is English passage, local strategies
EAGS is English passage, global strategies
FAM3 is familiarity rating for the English passage

Table 7
Correlation Analysis
2 'VAR' Variables: SQ EQ
Simple Statistics

LEVEL = 1

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SQ	43	52.3721	15.9255	2252.0	14.0000	82.0000
EQ	38	71.7368	15.9385	2726.0	34.0000	100.0

Pearson Correlation Coefficients / Prob > (R) under Ho: Rho=0
/ Number of Observations

	EQ
SQ	0.39737 0.0181 35

Table 7 (cont.)
Correlation Analysis
2 'VAR' Variables: SQ EQ
Simple Statistics

LEVEL = 2

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SQ	46	53.1304	14.5855	2444.0	19.0000	82.0000
EQ	47	79.3191	14.6021	3728.0	47.0000	100.0

Pearson Correlation Coefficients / Prob > (R) under Ho: Rho=0
/ Number of Observations

	EQ
SQ	0.10401 0.5017 44

LEVEL = 3

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SQ	23	63.7826	17.8579	1467.0	23.0000	91.0000
EQ	21	77.3810	10.4426	1625.0	54.0000	94.0000

Pearson Correlation Coefficients / Prob > (R) under Ho: Rho=O
/ Number of Observations

	EQ
SQ	-0.13261 .5666 21

LEVEL = 4

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
SQ	29	62.0345	18.7759	1799.0	22.0000	96.0000
EQ	29	77.5517	16.0704	2249.0	47.0000	100.0

Pearson Correlation Coefficients / Prob > (R) under Ho: Rho=O
/ Number of Observations

	EQ
SQ	0.37100 0.0475 29

SQ = Spanish Self-Perception of Strategy Use Questionnaire
EQ = English Self-Perception of Strategy Use Questionnaire